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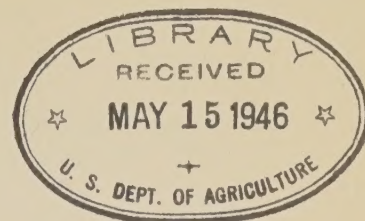
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EXTENSION

ENTOMOLOGIST



Most of the plans of work of the extension entomologists have passed over my desk. It is particularly interesting to note the way they are set up, and gratifying to see that most of them have been well thought out.

When one considers the infinite number of insect pests, the great masses of people to be served, the relatively few trained entomologists, and the much smaller number of entomologists able to devote full time to extension work, the need for the well coordinated plan becomes apparent.


Since it is impossible for these entomologists to make direct contact with the public with its insect problems, they should prepare teaching material and train other competent individuals, organizations, and agencies that are in a position to help this worthy cause.

A handwritten signature in cursive script, reading "M. P. Jones".

M. P. Jones  
Extension Entomologist

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND  
EXTENSION SERVICE, COOPERATING





## INTRODUCTION

Two articles/<sup>1</sup> recently appeared in the Southern Drug Journal in which the writers called attention to the desirability of druggists' better informing themselves on insect control and emphasizing the mutual advantage of closer cooperation between the druggist and the entomologist. These interesting articles are included in this issue of The Entomologist for your perusal.

When one considers the problems confronting one entomologist and the amount of work required of him in a State larger than all of the United States east of Indiana and north of North Carolina (excluding West Virginia), the need for devising ways to help himself become apparent. With this thought in mind, R. R. Reppert, extension entomologist of Texas, conceived the idea of training boys to be junior entomologists. The following article by Mr. Reppert outlines how this idea was put into practice.

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1.-Reference to these articles was made in the May issue of The Entomologist, but it was decided to include them in the July issue instead. They appear on pages 1-3.

## PERSONNEL

On May 30, 1938, an honorary degree of Doctor of Science was conferred upon Lee A. Strong, Chief of the Bureau of Entomology and Plant Quarantine, by Louisiana State University.

Dr. Charles E. Palm, a native of Arkansas, was appointed head of the Department of Entomology at Cornell University, effective July 1, 1938. Dr. Palm completed the work for his B. A. degree at the University of Arkansas in 1931, and his Ph.D. at Cornell University in 1935. He has worked for the New York State Experiment Station at Geneva, New York, the New York State College of Agriculture and Experiment Station at Cornell University, Ithaca, New York, and the Extension Service in the New York State College of Agriculture, and the State Department of Agriculture.

## SPECIAL ARTICLES

### Pharmacy and the Farmer (Editorial)

With the United States Department of Agriculture keeping the farmers posted pertaining to ways and means of controlling household insect pests, such as flies, ants, mosquitoes, fleas, bedbugs, and clothes moths, and suggesting that such activities be extended beyond the household, to the gardens and domestic animals, especially pets, and even to the still more extended field of farms and forests, the druggists in the smaller communities depending upon the farm trade for their existence, must keep in touch with such movements and merchandise their knowledge and stocks accordingly.

The Southeast, with its varied climatic conditions, long growing seasons, and especially throughout the sub-tropical and tropical areas, is a fertile field for the development of drug store departments devoted to the many chemicals and preparations designed for agricultural use.

So far as the household application of insect control is concerned, no one is in a better position to offer reliable advice and information and to supply the necessary insecticides and repellants than the druggists. And it is but a step in the same direction to give advice and sell the supplies for use on rose and flower bushes or other garden plants, while in the country districts, the farms may be looked upon as only enlarged gardens, offering a broader field of operation and a splendid opportunity for profit.

A letter addressed to the United States Department of Commerce, Washington, D. C., will bring a catalog of publications, many of which are free and none of which are at all expensive, and from the study of which, all needed information may be derived.

Here is a line of endeavor that is not likely to be exhausted within the lifetime of any person now living, or for many generations to come.



More than 700,000 kinds of insects have been described and named. More than 80,000 are to be found in America, north of Mexico, and over 10,000 of these are in some way injurious to man, his crops, or his possessions.

Before the spring planting and growing season is the opportune time for the druggist in the rural centers to contact his farm trade and determine the actual needs of his many customers. New conditions and new pests are constantly developing and stocks must be changed to meet these conditions.

To the druggist really interested in chemistry and biology, a splendid field for study and profits exist in aiding the farmer, the gardener, and the housewife in their problems of pest and plant control.

--Southeastern Drug Journal  
January 1938.

#### McCollum Discusses Journal Editorial

P. S. McCollum, president of the South Carolina Pharmaceutical Association, has a right to speak with authority on the editorial in the January issue of Southeastern Drug Journal, entitled, "Pharmacy and the Farmer." For, in addition to being head of the druggist organization in the State, his drug store, \* \* \* is located at Clemson College, where specialists make studies in order to keep the farmers posted on ways and means of controlling household insect pests, such as flies, ants, mosquitoes, fleas, bedbugs, and clothes moths, not to mention other pest problems confronting the farmer, such as the screwworm.

"It will pay druggists to keep in touch with what is going on in the field of entomology," President McCollum said. "Of course there are certain sections, such as there are in our State, where farm and city people are not bothered so much with insects, but in other sections the druggists are missing a wonderful opportunity if they do not capitalize on the sale of products which eradicate various household and farm pests.

"We have found from experience that it pays the druggists to study what the agriculture entomologists are doing to eliminate the many household and injurious insects that affect the farmer. Several years ago South Carolina was bothered with the screwworm, more especially in the lower part of the State. W. C. Nettles, entomologist of the Clemson College Extension Service, sent out a letter to every druggist in the State telling them of the possible spread of the screwworm and asking each pharmacist to let him know how much benzol and pine tar they had on hand. A large majority of the druggists cooperated by sending him the information, and in those sections where the pest was prevalent those who did not have a supply of the remedy on hand got busy and put it in stock.

"I mention this as just one illustration of how our agriculture experts and druggists can cooperate. In the long run, such cooperation helps the farmers from a financial standpoint and also aids the druggists in increasing



their profits from the sale of the product needed by the farmers. The same thing holds true with insects that invade both city and country property. If there happens to be an ant or cockroach epidemic in a community, the druggist is missing a golden opportunity not to feature the particular product that will alleviate the evil."

President McCollum laid particular stress on druggists' featuring these products which will be helpful to the farmers and to housewives.

"Window displays, advertising in the newspapers, radio announcements-- in fact, any advertising mediums the druggists are using to promote their business can be employed in placing these particular products before the public," he said. "After all, it is just a matter of striking while the iron is hot. The ice man puts the bulk of his advertising matter before the public during the summer months, while the coal man lays specific emphasis on his product in the winter. The same thing holds true for druggists. Their main objective is to keep in touch with things so that they can know when it is time to promote this and when it is time to promote that. And the best way to know, is to contact the man who is giving his full time to the study of the subject which might concern you from a sales as well as an altruistic standpoint. You'd hate to have a stampede of insects in your community and not be prepared to handle the demand because of lack of the product, and it would be poor merchandising to have a destructive pest in your midst and not let your people know you had something that would eliminate them.

"In conclusion, let me say that if you haven't already contacted the entomologist in your land grant college do so, by all means. Let him know you are interested in helping along with the work in which he is engaged. When you do you are automatically helping yourself from a sales standpoint. Personally, I think the Southeastern Drug Journal editorial is one of the best I have read. When you stop to think of it there is a close relationship between pharmacy and the farmer."

--Southeastern Drug Journal  
February 1938.

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#### PROJECT IN TRAINING JUNIOR ENTOMOLOGISTS

R. R. Reppert, Entomologist, Texas Extension Service

For a number of years, we have keenly realized our inability adequately to reach the agricultural interests of Texas with entomological information. We have published information on subjects of interest and have demonstrated control measures in the care of specific interest as we were able, but the field is so large and the problems so numerous that it is physically impossible for one person to make all the contacts necessary to execute fully an entomological program.



It therefore occurred to us some years ago to make use of the enthusiasm of youth. If the interest of club boys could be aroused and properly guided and fed, we believed that through them information from our central office could more efficiently be carried to communities and individuals; the club member's own enthusiasm would beget interest and action on the part of adults; the club members would be able to recognize an unusual insect outbreak early and so be of assistance both to the county agent and to our office; and finally they would be of service both to the Extension Service and to local agricultural interests by assisting in normal insect control programs as well as campaigns in unusually heavy infestation.

In 1937 we arranged for a definite project in establishing this work which we designated as a "Project in training junior entomologists." As we did not wish to undertake to put this new work over in too many counties until we had felt our way, we limited it to a county in each of our 12 Texas districts selected in consultation with each district agent concerned. The plan was thus outlined to the agent of the county selected and a first visit arranged to the county, at which the agent was asked to have present a limited number of boys who should themselves express an interest in pursuing the work and whom the agent felt would "stick." A second meeting with each of the 12 groups later in the year was planned, to determine their progress and to outline a further procedure. As a guide to the boys we made available to each group our own "Insect Sketches" that presented the essentials of entomology, as well as the 4-H Insect Club Manual, prepared by M. P. Jones, extension entomologist of the Federal office.

At our first meeting we outlined the work to the boys, to each of whom the literature above mentioned had been previously sent and in practically all cases carefully studied by them as evinced by their apparent knowledge of the subject. We interspersed the half-day program with a little entertainment and recreation.

As something for the boys to get first in mind from the economic standpoint, we asked them to give special attention for the period until we should make our second visit, to the six more important orders of Orthoptera, Lepidoptera, Coleoptera, Hemiptera, Diptera, and Hymenoptera, but we did not limit their study to these orders if they wish to pursue it further. On their first visit, we took the boys on a collecting trip. Parenthetically, we wish to explain that we did not emphasize the technical side except as became necessary to present the subject in an elementary way.

Unfortunately for the full success of this project, an unusually heavy grasshopper infestation developed, which, after our first round of meetings, demanded our full attention during the remainder of the year. For this reason, we were not able ourselves to keep interest stimulated by issuance of letters and circulars on specific economic insects as we had originally planned. Neither were we able to get back for the second visit - as a result of which failure on our part, we were depressed in believing that our project had failed in its purpose.



Circumstances have, of course, prevented us from securing the best results. Reports from the county agents, however, have been encouraging beyond what we had reason to expect. In Wheeler County of the Panhandle area where grasshoppers were a serious menace, and where more materials in control were used than any other Texas county, the boys took great interest and were of service to the agent and the farmers in locating egg beds and determining where trouble might be expected and in what intensity. They have aided also in the 1937 fall egg survey. In Hidalgo County in the lower Rio Grande Valley one boy has been inspired by what he has learned this season to undertake entomology as his life work and to secure his Ph.D. in the subject at Cornell University.

This project will be repeated in 1938, with, we hope, less diversion of our attention to other matters and greater aid on our part. The appreciation of its value on the part of the county agents, is indicated in that most of those accepting the work last year are asking for it again this season, with a new county included.

We intend to limit the number until we have developed a definite procedure and until the value of the project has become generally recognized.

#### TIMELY TOPICS

##### Airplane meets wind-borne grasshoppers at high elevations

The following notes were contained in a letter from John P. Gaty, vice president of the Beech Aircraft Corporation, under date of February 16: "On February 12, 1938, while flying from Des Moines, Iowa, to Kansas City, Mo., at an altitude of 2,000 feet, considerable numbers of grasshoppers were encountered. Many of them were killed by smashing into the structure of the airplane. Winds of gale velocity had been blowing from the Southwest for more than  $2\frac{1}{2}$  days. Undoubtedly these insects had been carried by this strong southwest wind into the area in which we found them. We have often encountered grasshoppers in flight at altitudes above 10,000 feet."

##### Grasshoppers in Canada

Canadian farmers expect no relief from grasshoppers this summer (1938), says Toronto correspondence to the New York Times. A survey made by the Department of Agriculture at Ottawa indicates that the insects in coming months will cover more territory than ever, some 63,000,000 acres in Manitoba, Saskatchewan, and Alberta. The pests have entered new areas, increased in areas where they have caused most harm, and slightly decreased in areas that have been but moderately infested. Control work with poison bait will have to be carried out carefully.

## Grasshopper Meal Gives Poor Results in Turkey Rations

The general belief that grasshoppers make an excellent turkey feed was not upheld in experiments at the Oklahoma A. & M. College on feeding value of grasshoppers under controlled conditions.

The grasshoppers were caught in traps, dried, and ground into fine meal. One hundred pounds of live grasshoppers made about 33 pounds of feed.

### Fed to poults

Three lots of 6-week-old poults were put on rations which were basically composed of yellow cornmeal, wheat bran, wheat shorts, alfalfa leaf meal, and salt. The first lot had 7 pounds of meat scrap, 7 pounds of dried buttermilk, and 7 pounds of cottonseed meal.

The second lot had the same basic elements with the addition of 8 pounds of dried grasshoppers and smaller amounts of buttermilk and meat scrap. Lot 3 had the same basic elements as the others except that 16 pounds of dried grasshoppers were added.

### Poults fail to gain

The poults in Lot 3 became listless after eating this feed two or three days. The rate of growth for the first week declined in proportion to the amount of ground grasshoppers in the feed. During the second week the mortality of the poults in Lot 3 was high, and those that survived made very little if any gain in body weight. Those birds remaining in Lot 3 after the second week were placed on the ration fed in Lot 1. Mortality stopped in 3 days.

The poults in Lot 2 showed fair gains in body weight but made slower gains than the poults in Lot 1 receiving no grasshoppers. At the end of 4 weeks the poults in Lot 2 appeared ragged and some were dying. When the poults were given the regular ration without grasshoppers, mortality stopped and they soon regained a normal appearance.

### No disease found

A younger group that was fed the regular ration of Lot 1 plus all the whole dry grasshoppers they would eat appeared normal until five weeks of age when they developed a condition similar to those fed the ground grasshoppers. Post mortem examinations in the laboratory failed to show the presence of disease in any of the poults.

The work is being continued in an effort to determine more definitely the value of grasshoppers in turkey feeding.

Oklahoma Annual Report, 1937.



### Hot-Water Treatment Controls Cyclamen Mite

F. F. Smith, of the Beltsville, Md., laboratory, reports that the first application of the hot-water treatment to control Tarsonemus pallidus Banks on cyclamens under commercial conditions was made on approximately 4,000 plants at Alexandria, Va., in October 1937. Approximately 90 percent of the plants subjected to this treatment showed severe injury by the cyclamen mite, which would have rendered them valueless had not some control been applied. In the course of these tests, the mite-infested plants were subjected to the standard hot-water treatment of immersing the plants completely for 15 minutes in hot water maintained at a temperature of 110° F. As a result of this treatment, the plants showed no evidence of injury and, compared with typical untreated plants reserved as checks, showed considerable improvement in growth and flower-bud development. At the end of November an examination of the treated plants disclosed that they were apparently free from mites and that they developed satisfactorily without any indication of injury from the treatment.

### Larvicide Combats Tsetse Fly

Chemical means invented in America promise to give victory to white men in Africa on one of the most desperately contended fronts in mankind's war against insects--the campaign against the tsetse fly, says a Science Service copyright report. These insects, bearers of the deadly African sleeping sickness to human beings and scourges to livestock, flee from a spray originally developed for the control of New Jersey mosquitoes. The spray, the invention of Dr. J. M. Ginsburg, biochemist of the New Jersey Experiment Station, consists of substances extracted from pyrethrum, dissolved in light petroleum oil. Discovery of the high value of the New Jersey larvicide as a tsetse repellent was made by an American expedition in Africa, the Morse Museum African-Asiatic Expedition. British authorities in Tanganyika Territory, which is especially afflicted with tsetse flies, have shown a keen interest in the New Jersey compound, and a small quantity has been sent to them for testing. Mrs. Julie B. Morse, in charge of research for the expedition, writes enthusiastically of the success of this pyrethrum mixture, as contrasted with the poor results obtained with earlier types of repellents.

### Australian Stock Disease

H. R. Seddon, Professor of Veterinary Science at Brisbane University, declared at the Australian Veterinary Science Congress yesterday that research had revealed that an unidentified winged insect caused the new cattle disease known as "three-day sickness," according to a Melbourne wireless to the New York Times. This malady is so serious, although brief, that when herds are affected production ceases, necessitating that dairymen in infected areas buy canned milk for domestic use. The insect reached the northwest portion of Northern Australia in February 1936, and infected cattle with a fever that was spread by indigenous insects and presumably carried by winds through Queensland, New South Wales, and parts of Victoria.

### Insects Damage Pickle Barrels

E. A. Back, Washington, D. C., reports an interesting and rather unusual case of damage, caused by insects recently in a pickle factory at New Lebanon, Ky. Considerable difficulty was experienced in keeping the brine in which pickles were preserved from leaking out of the barrels after the pickles had been packed for shipment. A close examination of the defective barrels showed that a large number of them were riddled with tiny holes; further observation revealed the presence of a small bostrichid beetle, Pterocyclon fasciatum. Apparently, the wood was attacked after the barrels had been filled with brine. Practically all of the oak barrels at the plant were damaged, whereas those made of cypress and other woods were free from infestation.

### Corn Borer Control

A practical way to control the European corn borer on early market sweet corn has been found after years of work by State and Federal entomologists. Recent tests by entomologists of the Department and the Connecticut Experiment Station show that several compounds are effective in saving sweet corn, particularly early varieties. The new insecticides are: (1) nicotine tannate solutions, prepared from nicotine, and Chinese gallo-tannin, an easily available form of tannic acid; (2) derris sprays; (3) phenothiazine (a compound of sulphur and a commercially available dye intermediate) spray; and (4) nicotine dust, a mixture of nicotine tannate powder and powdered nicotine bentonite (a compound of nicotine and common clay). None of these preparations comes ready mixed.

(Circular E-410 "Insecticidal treatment of early market sweet corn infested by the European corn borer," contains detailed directions for preparing these mixtures. Copy of the circular may be obtained from the Bureau of Entomology and Plant Quarantine, U. S. Dept. Agr.)

### LIGHT- SENSITIVE INSECTICIDE CAN BE MADE MORE LASTING

A patent has been granted Mayne R. Coe, U. S. Department of Agriculture, Washington, D. C., on a method for stabilizing pyrethrum powder, nicotine dust, and rotenone against deterioration by light. The period of insect killing potency is greatly extended by this process, which consists of enclosing each particle of insecticide in a globule-forming liquid colored with a chlorophyll green dye. This process excludes all wave lengths of light below 4,900 Angstroms units all of which destroy the potency of these insecticides.

(Patent No. 2,090,109, Aug. 17, 1937; applied Nov. 15, 1933. Stabilized insecticide of plant origin).



## INSECT ENEMIES OF PLANTS

"Government entomologists are looking for the insect enemies of an American plant, with the object of shipping them off to Australia," says Science Digest (January). "The idea is not to banish the insects, but to encourage them to eat the plant, which has become established in Australia as a noxious weed, though it is not especially troublesome at home. The plant in question is a member of the mint family, and is known to botanists as *Salvia reflexa*. It is a near relative of the ornamental scarlet sage cultivated in gardens. Once before an American plant, the prickly pear cactus, became a weed scourge in Australia. It was conquered by an insect, the caterpillar of the *Cactoblastis* moth. It is hoped in Australia that an American eradicator for an American weed can be found again."

## ELM DISEASE ERADICATION

The American City (March) in an item on the Dutch elm disease, says in part: "If each town would stop to think of the value of its own elms and realize that the existence of the disease anywhere in the United States is a direct threat to their lives, the justification of the Government expenditures would be forcefully apparent. Probably the greatest contributing factor in the spread of this blight is the public indifference to the Government program of education."

## PRESERVATIVE

R. F. Poole of North Carolina has called attention to a very satisfactory preservative for plant disease specimens. It consists of a combination of sulphur dioxide and formaldehyde which retains natural colors of fruits and vegetables. Specimens were exhibited of sweetpotatoes and apples put up in 1929 which had all the appearance of fresh specimens. This can be obtained commercially. (Virginia Smelting Co., West Norfolk, Va.) and T. E. Rawlins of California suggests that it could possibly be prepared in the laboratory by bubbling  $\text{SO}_2$  through a concentrated solution of formaldehyde, the gas being formed by dripping sulphuric acid through a thistle tube into a saturated solution of sodium sulphite.

## Results of Kansas Fatality Study Evoke Comparison

"A recent study by the Kansas Board of Health gives valuable information on farm accident fatalities in that State which may have a general application. It was found that 29 percent of the deaths were due to farm machinery, 20 percent to injuries by animals, 12 percent to excessive heat, 9 percent to falls, 8 percent to vehicles, and 5 percent to lightning. The remaining 17 percent includes burns, freezing to death, and crushing by falling trees. Farm hazards are thus pretty well classified, and it should be possible to work out a safety program to cover them all."

It is rather interesting to compare these data with the following:  
In 1937 78,471 tons of poison baits were used for grasshopper control and of the thousands of pounds of other poisonous insecticides handled, accidents were of such minor importance that they were not listed.

#### AMUSEMENT EXPENDITURES

(How can we extension specialists give more than entertainment for the 29 cents expended for movies?)

Out of every dollar spent for amusement by American families in 140 villages studied by the Bureau of Home Economics, more than 29 cents went for movies, says a report in the New York Times. The study covered 9,407 families for a 12-month period in 1935 and 1936. Every type of expenditure for amusement, including pets and toys for the children, was studied. The average spent per family per year for the movies was \$12 in New England villages; \$10 in the Central and Atlantic States; \$16 in the Mountain and Plains States; \$15 in the Pacific States; and \$16 for the white families of the southeastern villages.

#### GERMAN FARM LABOR

A Berlin wireless to the New York Times reports that, to stem the "flight from the land," which has produced a serious shortage of agricultural labor, Dr. Fritz Reinhardt, State Secretary in the German Finance Ministry, has announced that henceforth persons who, in obtaining marriage aid loans, prove they have continuously worked in agriculture or forestry since leaving school will be permitted to delay repayment of the loans until they reach the age of 30, and if they prove that up to that period they have still continued in agricultural occupations, all claim for repayment will be canceled and the loans will become State gifts.

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Film strip No. 503, entitled "Insect pests of garden vegetables and their control" has just been released.

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Peach spray program. Univ. Del., Information card 38. Newark.

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Apple spray schedule for commercial and home plantings. By Divisions of Horticulture, Botany, and Entomology. Purdue Univ., Dept. Agr. Ext. Bull. 181 (3d. rev.) Lafayette.

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2.-State publications should be requested from the specified State agricultural college (college addresses are given), where they generally are available for free distribution. Such publications are not available for distribution by the U. S. Department of Agriculture.

Kentucky

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Peach and plum spray schedule. Ky. Agr. Col. Circ. 293, rev. Lexington.

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Mich. State Col. Ext. 154, rev. East Lansing.

Minnesota

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Mississippi

Mississippi spray calendar. H. M. McKay. Miss. State Col. Ext. Circ.  
43. Miss.

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T. J. Talbert, Leonard Haseman, and H. G. Swartwout. Mo. Agr. Col. Ext.  
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Montana

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Wis. Agr. Col. Ext. Spec. Circ. Madison.



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Teaching conservation of wildlife through 4-H clubs. Ruth Lohmann, Ext. Serv., 34 p. illus. M. P. 291M.

Notices of judgment under Caustic Poison Act. Food and Drug Administration. Pp. 1-2. (N.J., C.P. 82-84.)

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